2006 Science Learning Standards			
District of Columbia Science			
Grades 9-12 (Physics)			
Activity/Lesson	**State**	**Standards**	
Session-10 (1-5)	DC	SCI.P.1.10	Select and use appropriate tools and technology to perform tests, collect data, analyze relationships, and display data. (The focus is on manual graphing, interpreting graphs, and mastery of metric measurements and units, with supplementary use of computers and electronic data gathering when appropriate.)
Session-10 (1-5)	DC	SCI.P.1.13	Apply mathematical relationships involving linear and quadratic equations, simple trigonometric relationships, exponential growth and decay laws, and logarithmic relationships to scientific situations.
Session-10 (1-5)	DC	SCI.P.2.1	Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law).
Session-10 (1-5)	DC	SCI.P.2.2	Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma.
Session-10 (1-5)	DC	SCI.P.2.3	Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F2 on 1 (Newton's third law).
Session-10 (1-5)	DC	SCI.P.2.4	Explain that Newton's laws of motion are not universally applicable, but they provide very good approximations, unless an object is moving close to the speed of light, has a very large mass, or is small enough that quantum effects are important.
Session-10 (1-5)	DC	SCI.P.2.5	Explain that every object in the universe exerts an attractive force on every other object. Know the magnitude of the force is proportional to the product of the masses of the two objects and inversely proportional to the distance between them: $F = G\ m1m2/r^2$.
Session-10 (1-5)	DC	SCI.P.2.7	Explain how a force acting on an object perpendicular to the direction of its motion causes it to change direction but not speed.
Session-10 (1-5)	DC	SCI.P.2.10	Apply the law F = ma to solve one-dimensional motion problems involving constant forces (Newton's second law).
Session-10 (1-5)	DC	SCI.P.2.12	Solve problems in circular motion, using the formula for centripetal acceleration in the following form: $a = v^2/r$.

Session-10 (1-5)	DC	SCI.P.2.13	Create and interpret graphs of speed versus time and the position and speed of an object undergoing constant acceleration.
Session-10 (1-5)	DC	SCI.P.3.1	Recognize that when a net force, F, acts through a distance, delta x, on an object of mass, m, which is initially at rest, work, W = F delta x, is done on the object; the object acquires a velocity, v, and a kinetic energy, K = ½ mv2 = W = F delta x.
Session-10 (1-5)	DC	SCI.P.3.12	Calculate the momentum of an object as the product p = mv.